

Monthly Marine Biotoxin Report

May 2003

Technical Report No. 03-15

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May 2003. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

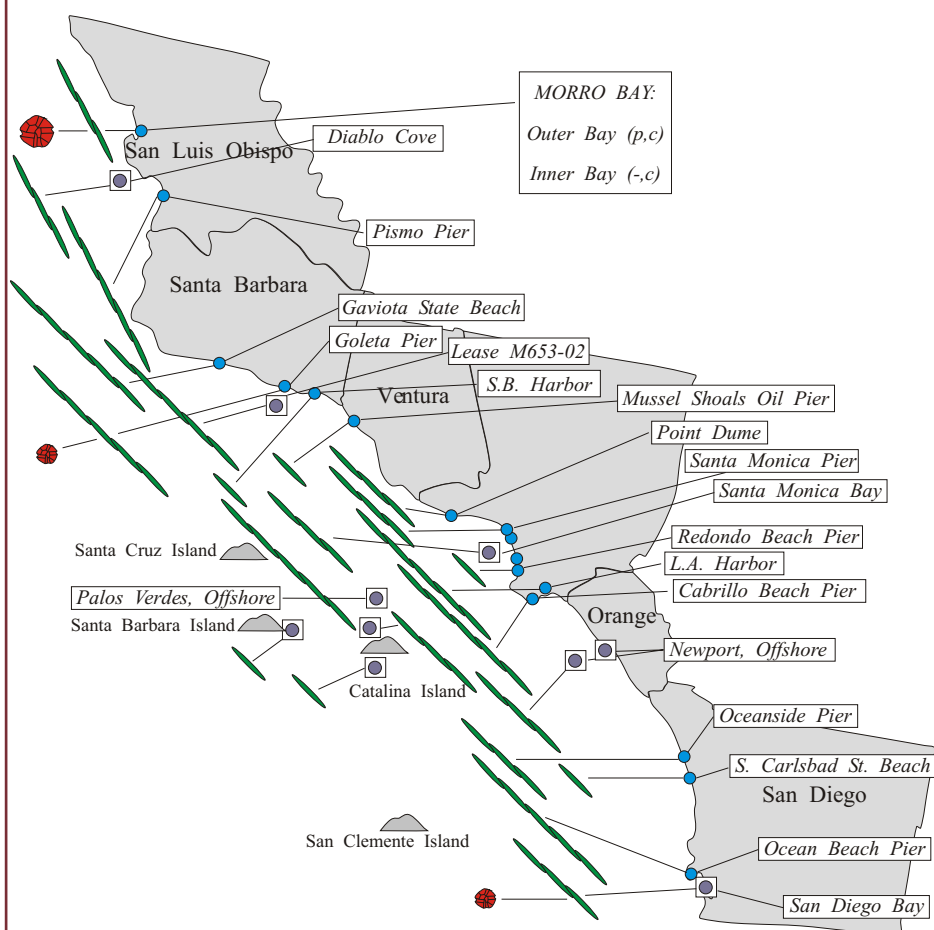
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning:

Alexandrium was present at several southern California sites during May. This dinoflagellate was observed at Goleta Pier (Santa Barbara

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during May, 2003.



Relative Abundance of Known Toxin Producers

Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

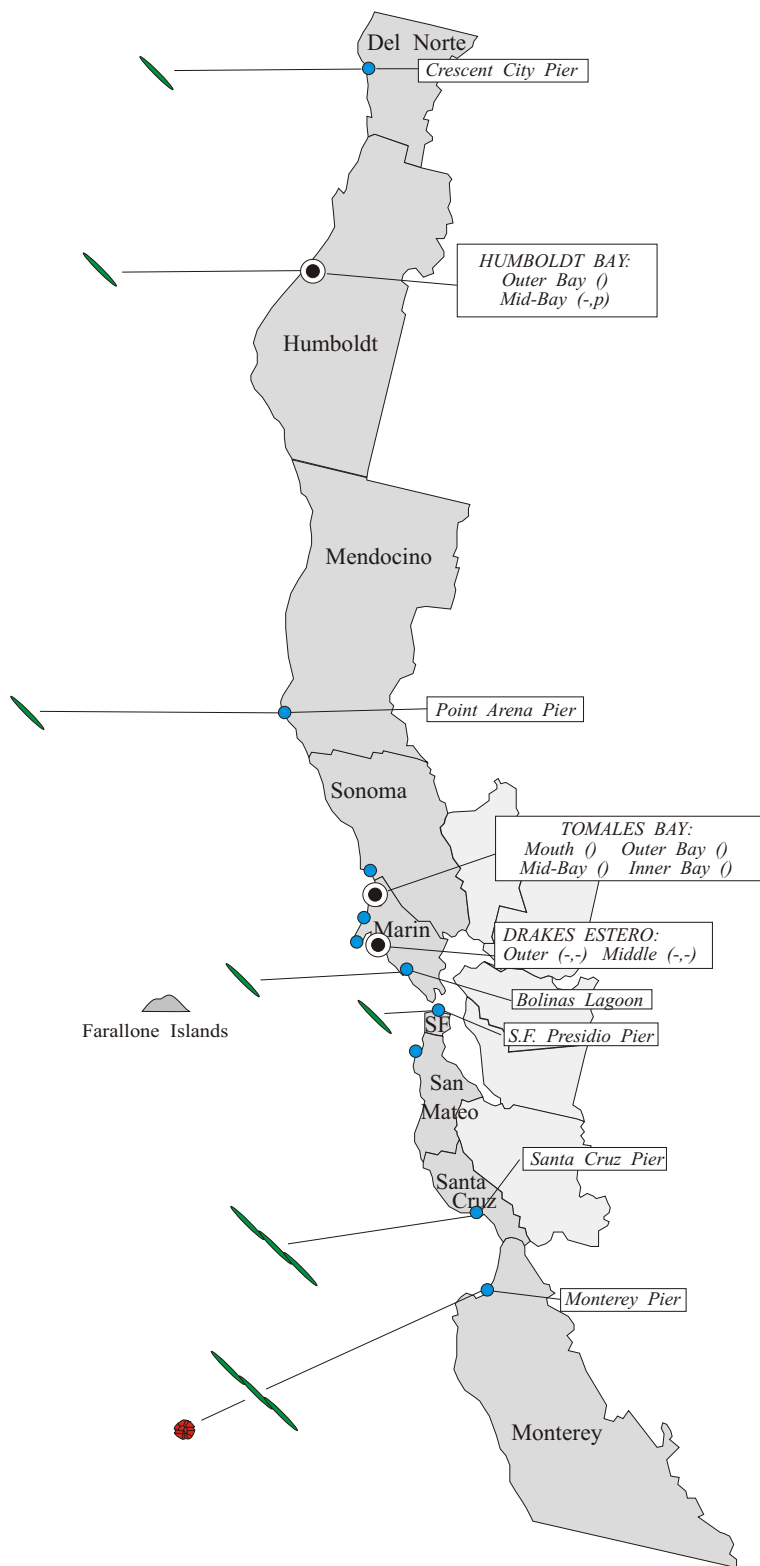
MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

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Figure 2. Distribution of toxin-producing phytoplankton in Northern California during May, 2003.



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County) on May 7. Subsequent singular observations of *Alexandrium* were also made in San Diego Bay (May 18) and Morro Bay (May 31). The number of cells was quite low in all cases. PSP toxicity was not detected in any shellfish samples collected at sites along the Southern California coast throughout the month.

Domoic Acid:

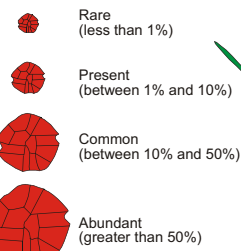
The distribution and relative abundance of *Pseudo-nitzschia* continued to increase along the southern California coast during May (Figure 1). The greatest densities were observed at sites along the Santa Barbara coast and offshore, although this diatom was dominant at most sites sampled in May. The relative abundance and cell number for *Pseudo-nitzschia* remained high through the first three weeks of the month at sites between San Luis Obispo and Los Angeles counties.

Thanks to the efforts of our field samplers and field observers in detecting the trend of increasing relative abundance of *Pseudo-nitzschia*, the program participants in our shellfish monitoring program increased their sampling effort of shellfish for domoic acid analysis. This was especially true of the Los

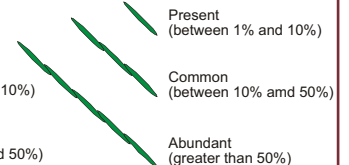
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



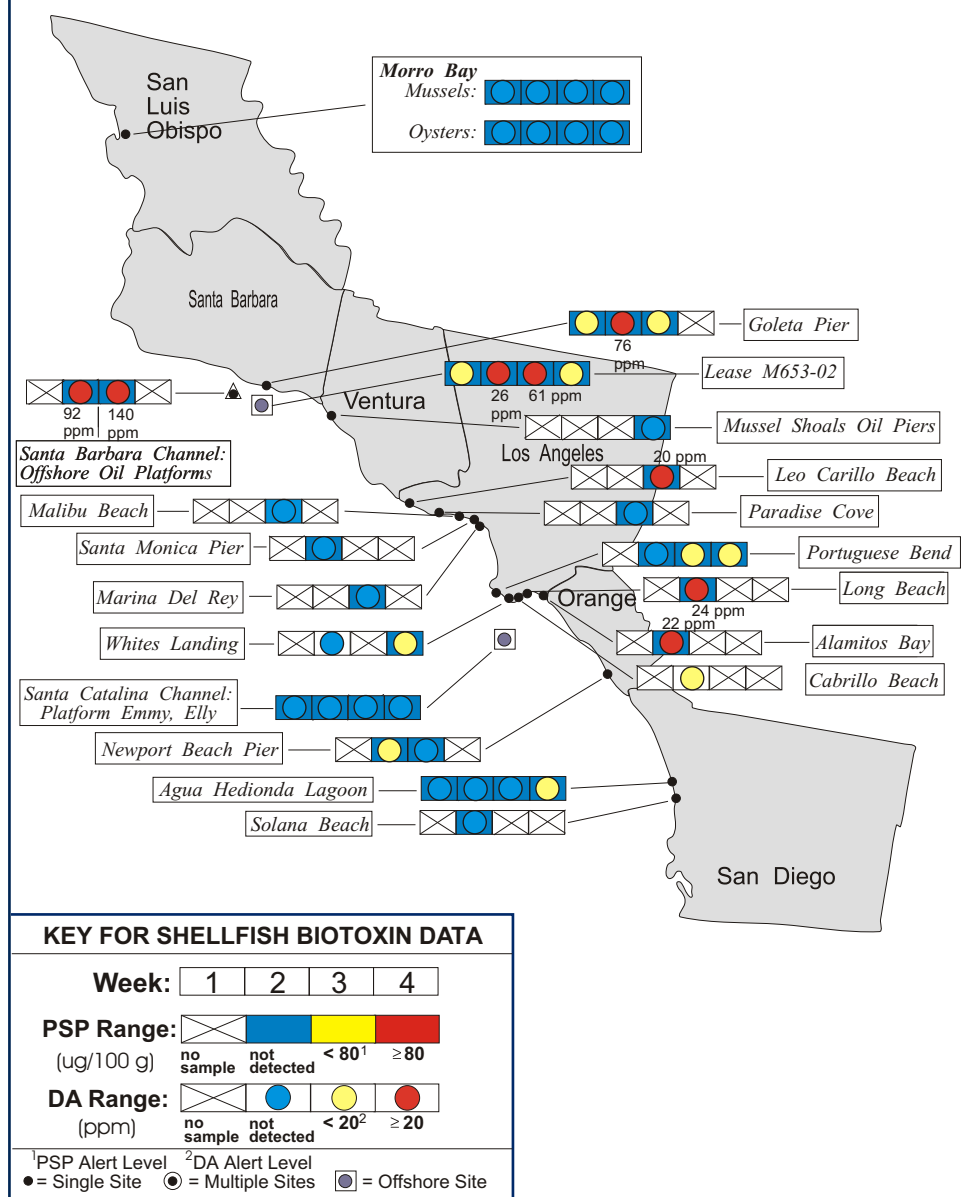
MONTHLY SAMPLING STATIONS:

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(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
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Figure 3. Distribution of shellfish biotoxins in Southern California during May, 2003.



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Angeles County Health Department public health investigators, who collected 16 samples from 14 different locations throughout the month. Following the pattern of increase observed for *Pseudo-nitzschia*, the concentration of domoic acid also increased through the first three weeks of May at sites along the Santa Barbara coast (Figure 3). Low levels of

domoic acid were detected during the first week of May at two sites in Santa Barbara. By the second week the concentration of this toxin in mussels had increased well above the federal alert level of 20 ppm at Goleta Pier (76 ppm), at an offshore oil platform (92 ppm), and farther south at Long Beach (24 ppm) and Alamitos Bay (22 ppm). Concentrations below the alert level were also detected during this time at Cabrillo Pier and Newport Beach Pier.

During the third week of May the concentration of domoic acid increased at two offshore locations in Santa Barbara but decreased onshore at Goleta Pier. The highest concentration detected during this event was 140 ppm in mussels from an offshore oil platform in Santa Barbara Channel. During this period a low level of toxin was also detected at Portuguese Bend in Los Angeles County. By the fourth week in May the concentrations of domoic acid had declined significantly in Santa Barbara but persisted at low levels at several sites farther down coast along the Los Angeles and San Diego coastline.

Nontoxic Events:

Pseudo-nitzschia was by far the dominant species at most locations throughout May. However there were significant numbers of other phytoplankton species at times. Diatoms were dominant along the San Luis Obispo coast, particularly *Thalassiosira*, *Skeletonema*, and *Rhizosolenia*. Farther down coast, from Santa Barbara through San Diego, there was a mix of diatoms and dinoflagellates, with *Ceratium*, *Prorocentrum*, and *Prorocentrum* the most common of the latter group.

Northern California Summary:

Paralytic Shellfish Poisoning:

Alexandrium was absent from almost all sampling sites during May. A very low number of this dinoflagellate was observed in a sample collected from the

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Monterey commercial pier on May 31 (Figure 2).

The low levels of PSP toxins detected in the Drakes Bay region of Marin County in previous months continued through the first two weeks of May. In addition, a low level of PSP toxins was also detected in mussels collected from China Beach (San Francisco County) during the first week of May.

Domoic Acid:

Pseudo-nitzschia was present along the entire Northern California coastline during May (Figure 2). The relative abundance of this diatom was significantly lower than in April. Although moderate numbers persisted inside Monterey Bay, domoic acid was not detected in mussels collected at the Santa Cruz Pier throughout the month.

Nontoxic Events:

Diatoms continued to dominate the assemblage of phytoplankton species in samples from our volunteer network throughout May. *Coscinodiscus* and *Skeletonema* were common at most locations along the coast, particularly at Crescent City (Del Norte County), and Bolinas Lagoon (Marin County). The bloom of the dinoflagellate *Prorocentrum* observed inside Tomales Bay since February continued through May.



Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2003.

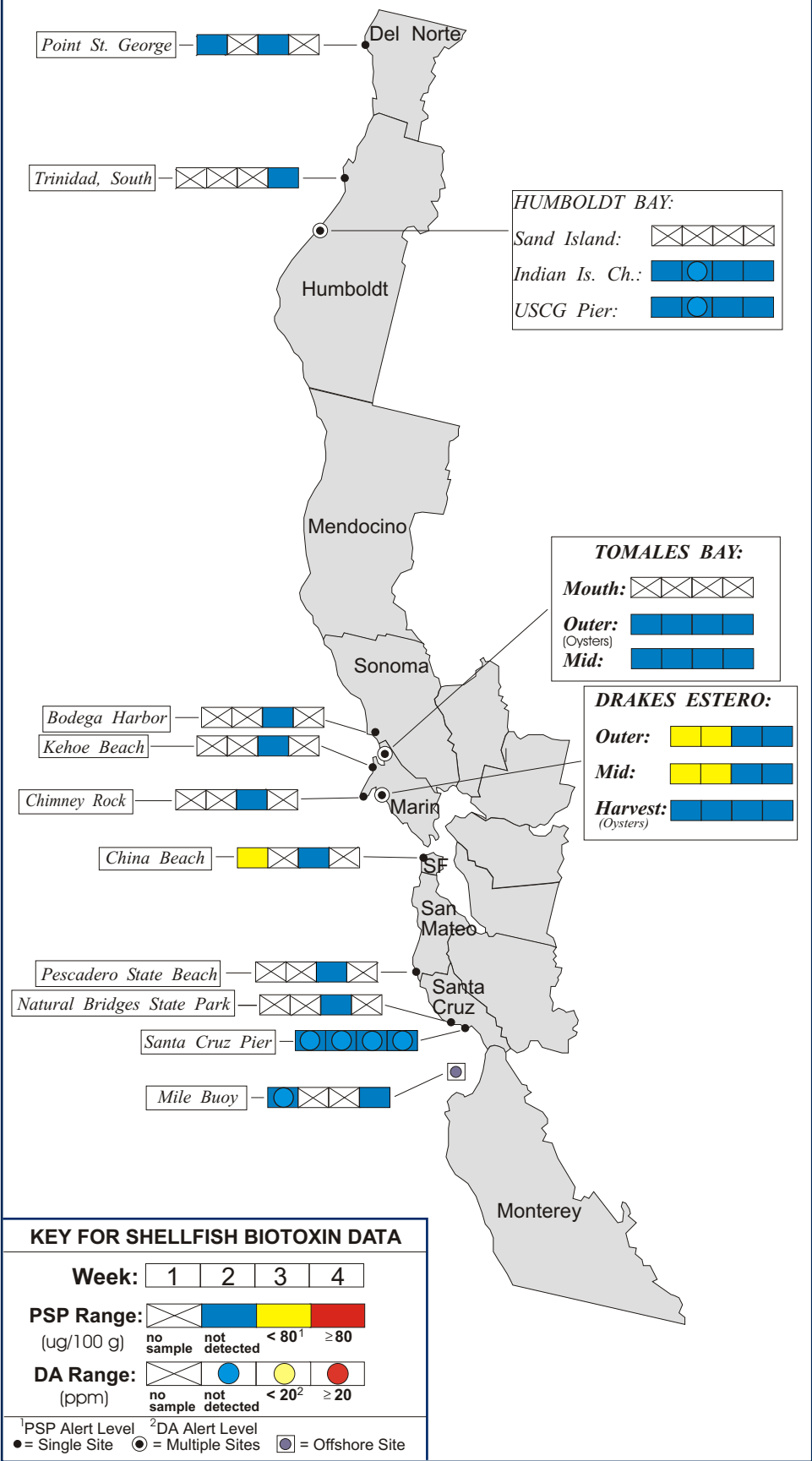


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during May, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
Mendocino	None Submitted	
Sonoma	CDHS Marine Biotoxin Progra	1
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	4
	Johnson Oyster Company	20
	Marin Oyster Company	4
	CDHS Marine Biotoxin Program	2
San Francisco	San Francisco County Health Department	2
San Mateo		1
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	U.C. Santa Cruzd	1
San Luis Obispo	Williams Shellfish Company	7
Santa Barbara	U.C. Santa Barbara Marine Science Institute	5
	Santa Barbara Mariculture Company	4
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	16
	Aquarium of the Pacific Long Beach	2
Orange	Ecomar, Inc.	4
	Orange County Health Care Agency	2
San Diego	Carlsbad Aquafarms, Inc.	6
	CDHS Volunteer (Paul Sims, Spence Pickett)	1

Volunteer Monitoring

The strength of California's Marine Biotoxin Monitoring Program derives largely from the dedicated program participants who collect shellfish and phytoplankton samples on a routine basis. Without their continued support it would be impossible to adequately protect the public from the marine biotoxins that occur at unpredictable times along our coast.

The phytoplankton samplers and field observers have added a new dimension to

routine biotoxin monitoring, allowing us to detect the early stages of a potentially toxic bloom. This has allowed us to alert the participants in our shellfish monitoring program within the areas of concern, rather than sounding a statewide alert with the first positive toxin result.

The people who participate in our monitoring programs are more than sample collectors. They are local experts and often find themselves in the impromptu role of "educator" as they explain their activities to the curious public.

QUARANTINES:

The annual quarantine on the sport-harvesting of mussels went into effect on May 1st and will continue through October 31st. This annual quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. This quarantine does not affect the commercial shellfish growing areas in California. All commercial shellfish growers certified by the State of California are required to submit routine samples for biotoxin analysis, allowing us to closely monitor for the occurrence of any toxin. Harvesting closures are imposed if toxin levels reach the federal alert level.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Only the white meat of clams and scallops should be prepared for human consumption.

We recommend that persons engaged in the sport-harvesting of any bivalve shellfish (e.g., mussels, clams, scallops) contact the Department's "Shellfish Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.

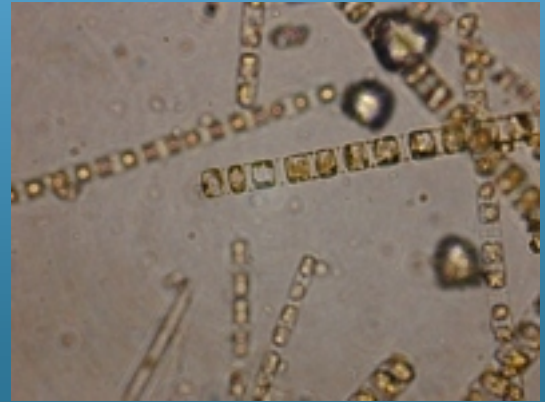
For those of you who are active participants in our monitoring programs: Thank you! For those of you interested in participating in some aspect of this unique public health program please contact us for more information.

And finally, for everyone on our distribution list, please take note of the people, agencies, and companies listed in Tables 1 and 2: they are solely responsible for the quantity and quality of the data presented in these reports and deserve all our thanks for a job well done!

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during May, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	CDHS Volunteer (Amy Johnson)	2
Sonoma	Bodega Marine Laboratory	1
	CDHS Volunteer (Cathleen Carnon)	1
	CDHS Marine Biotoxin Program	1
Marin	CDHS Volunteer (Brent Anderson)	4
	Johnson Oyster Company	5
	CDHS Marine Biotoxin Program	2
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	3
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	None Submitted	
Monterey	CDHS Volunteer (Jerry Norbn)	3
San Luis Obispo	CDHS Volunteers (Rene and Auburn Atkins, Cornie Marangi)	3
	Morro Bay Natural History Museum	4
	Morro Bay National Estuary Program	3
	Tenera Environmental	4
	Williams Shellfish Company	1
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	California Department of Parks and Recreation	1
	Santa Barbara City College	2
	Santa Barbara Mariculture Company	3
Ventura	Ventura County Environmental Health Department	1
	Catalina Tall Ships Expedition	1
Los Angeles	Los Angeles County Health Department	9
	Los Angeles County Sanitation District	6
	Catalina Tall Ships Expedition	7
	City of Los Angeles Environmental Monitoring Division	2
Orange	Orange County Sanitation District	4
San Diego	San Diego County Environmental Health Department	2
	CDHS Volunteer (Paul Sims, Randy Dick)	9

PHYTOPLANKTON GALLERY



Skeletonema was a common diatom species from Del Norte to Los Angeles during May.



Pseudo-nitzschia, the diatom that produces domoic acid, was prevalent from San Luis Obispo through San Diego.



The dinoflagellate *Ceratium furca* was common at sites from Los Angeles through San Diego.